15

VI.—THE FISHES OF THE FIRTH OF CLYDE.

By Thomas Scott, F.L.S., Mem. Soc. Zool. de France.

It has been considered desirable that a list should be prepared of the fishes which have from time to time been observed within the limits of the Clyde estuary. The list is not a descriptive one, but is merely an enumeration of the various species which have come under the notice of the writer, together with those which have been recorded by different authors who have written on the fauna of the Clyde, or which have been seen by persons whose accuracy may be relied on. The following are the chief sources from which my information concerning Clyde fishes has been obtained :—

(1.) A List of Loch Fyne Fishes, prepared for the most part by the late George Brook, Esq., F.L.S., and published in the *Fourth Annual Report of the Fishery Board for Scotland* (1886). (A Revised List of Loch Fyne Fishes is published in the Board's *Fifteenth Annual Report*, Part III., 1897).*

(2.) A paper by Dr. Albert C. L. G. Günther, F.R.S., entitled, "Report on the Fishes obtained by Mr. (now Sir) J. Murray in deep water on the North-West Coast of Scotland, between April 1887 and February 1888," published in the Proceedings of the Royal Society, Edinburgh, Vol. XV. (1888). In this report 31 species are recorded, one of which was new to science, while two were additions to the British fauna. The species recorded in Dr. Günther's paper were mostly from the Clyde area, and there are some interesting notes on the bathymetrical distribution of the species.

(3.) *A Vertebrate Fauna of Argyle and the Inner Hebrides*, by J. A. Harvey-Brown and Thomas E. Buckley, published in 1892. The part of this work which is referred to in the present paper is the separate reprint of the list of fishes. In the list of fishes given in this work, the authors include Dr. Günther's records mentioned above, in the form of foot-notes under each of the species to which the records specially refer ; additional Clyde records are also given in this work.

(4.) The statistics published in the *Annual Reports of the Fishery Board for Scotland*, in so far as they relate to the fishes of the Firth of Clyde, and especially to those fishes which have been captured by the Fishery steamer "Garland."

I have also to acknowledge my indebtedness to Mr. Duthie, the Fishery Officer at Girvan, and to Mr. Gray of the Marine Station, Millport, Cumbrae, for interesting information relating to Clyde fishes. Other sources of information are duly acknowledged in the sequel.

Before proceeding with the enumeration of species, it may be of interest to refer to some points concerning the distribution of one or two of the forms which are usually considered to be more or less rare in the Clyde area. Previous to the investigations carried on by Dr. (now Sir) John Murray, by means of the s.s. "Medusa," the fish usually called the Sharp-tailed Lumpenus, *Lumpenus lampetræformis*, was not known to occur within the limits of the Clyde; but now, by the use of a small-mesh trawl-net, this fish is found to be comparatively frequent

* The compiler of this revised list had the privilege of consulting the records of Loch Fyne fauna obtained by the s.s. "Medusa" as the result of the investigations carried on by Sir John Murray on the West Coast.

and more or less generally distributed, especially in the deep-water area. The same may be said of the Argentine, *Argentina sphyræna*. This fish, which used to be considered a rare species in the Clyde, is really not very uncommon when sought for with suitable appliances. It may be pointed out further that if anyone were to look through the lists of Clyde fishes captured by the "Garland," he would fail to find a single record of a Halibut, which is only occasionally taken by a trawl. Moreover, the halibut is not mentioned for the Clyde in Dr. Günther's paper, nor in the work published by Harvey-Brown and T. E. Buckley already cited, yet the Fishery Officer at Girvan informs me that halibut are not very rare in the seaward part of the Clyde estuary, and that they are sometimes caught in the deep water off Ayr; while in a letter, dated the 28th December last, he states that he had seen, a few days before, a young halibut landed at Girvan, which had been caught between that place and Ailsa Craig, and which weighed about a stone.

In looking through the statistics of the steamer "Garland," it will also have been observed that Turbot and Brill are not very frequently mentioned in the lists of fishes captured by the steamer in the Clyde estuary, yet there is a more or less regular turbot fishery carried on off Girvan, and sometimes a considerable number of these fishes, captured in the Clyde by gill-nets, are brought to market. It is obvious from facts such as these that, though one mode of fishing may yield negative results in respect of certain species, it does not necessarily follow that these species are absent or even rare. The results obtained by the use of the ordinary beam or otter trawl are usually very different from those obtained by the use of special nets or lines, therefore a kind of fish that may be seldom or never captured by one set of appliances, may by the use of a different set be found comparatively frequent.

The present enumeration comprises 113 species of Clyde fishes, but the occurrence of one or two of these appears to be somewhat doubtful; and it is also very desirable in the case of one or two others which, though their presence in the Clyde seems to be fairly well attested, further information should be obtained concerning them. I have indicated such species by enclosing their names within square brackets, and also by the notes referring to them.

There are several kinds of fishes which appear to be equally at home in the sea and in brackish water, and in some cases even in water that is fresh or nearly so; and there is a considerable divergence of opinion as to which, and how many, of these should be included in lists of *marine* species, and of those which should more properly be regarded as *fresh-water* forms. One has only to compare Professor H. G. Seeley's interesting work on *The Fresh-Water Fishes of Europe* with that of *The British Marine Food-Fishes*, by Professor M'Intosh and Mr. A. T. Masterman, to find examples of this difference of opinion. In the present list there will probably be found species which, in the opinion of some people, should have been excluded as belonging more properly to the fresh-water group; but when we find distinguished writers failing to agree on such a point as this, I may be excused if unable to prepare a list perfect in this respect. The basis of this list is the enumeration of Loch Fyne fishes, already referred to, prepared by the late George Brook, Esq., and published in 1886.

I have followed as far as possible the nomenclature used by Professor M'Intosh and Masterman in their *British Marine Food-Fishes*, while the arrangement of the species is in accordance with that of the *History of British Fishes* by Dr. Francis Day.

The following abbreviations are also used :—

(B. & S.) Refers to the list of Loch Fyne fishes published in the *Fourth Annual Report of the Fishery Board for Scotland.*

(Günther) Refers to Dr. Günther's paper published in the Proceedings of the Royal Society, Edinburgh, 1888, Vol. XV., pp. 205-220.

(H.B.) Refers to the separate reprint of the List of Fishes published in Harvey-Brown and Buckley's work on the Vertebrate Fauna of Argyle and the Inner Hebrides.

(G.) Refers to the "Garland's" statistics.

(M.) Refers to MS. records for Loch Fyne of the s.s. "Medusa," showing some of the records obtained by Sir John Murray while investigating the marine fauna and flora of the West Coast.

SUB-CLASS TELEOSTEI.

Order ACANTHOPTERYGII.

Fam. Percidæ.

Polyprion americanus (Bl. Schneider). The Stone Basse.

This is the *Polyprion cernium* of Day's *British Fishes.* "One was taken years ago at the mouth of the Clyde" (Aflalo). "It was also taken off Little Cumbrae in 1870 by Dr. J. Young" (H.B. p. 184). The Stone Basse appears to be only an occasional visitor to the Clyde, for although it is included in the *Vertebrate Fauna of Argyle and the Inner Hebrides* the above is the only locality for the species given by the authors.

Fam. Mullidæ, Swainson.

Mullus barbatus, Linné. Surmullet, Red Mullet.

Loch Fyne (Captain Campbell of Inverneil). Captain Campbell in referring to this species says :—"I caught one in Loch Fyne . . . in a trammel net in 10 fathoms, and though I tried in many places for them I never got another" (*see* H.B., p. 185).

Fam. Sparidæ, Cuvier.

Pagellus centrodontus (De la Roche). The Common Sea Bream.

One specimen of *Pagellus centrodontus* was taken by Mr. M. P. Bell at Cumbrae, on July 12th, 1885 (*see* Robertson in Proc. N.H.S. Glasgow, Vol. I., p. 119). When at Tarbert in 1885–86, I remember seeing a specimen which was washed ashore in East Loch Tarbert, and which appeared to have been but a short time dead. It was probably captured in the nets of the herring boats fishing in the vicinity of East Tarbert and having been thrown back into the sea had drifted ashore. In the *Vertebrate Fauna of Argyle and the Inner Hebrides*, *Pagellus centrodontus* is described as "locally numerous throughout the West of Scotland." The species is sometimes brought in in large numbers to the fish market at Aberdeen.

Fam. Cottidæ.

Cottus scorpius, Linné. The Sea Scorpion.

Cottus scorpius is generally distributed throughout the Clyde and Loch Fyne, but it seems to be more frequent inshore than in deep water. "Two immature specimens were taken between Cloch Lighthouse and

Whiting Bay in 15 to 30 fathoms in July, and one immature specimen between French and Kilbrennan Sound in 10 to 14 fathoms in March" (Günther). The variety *grœlandicus* is also occasionally obtained in Loch Fyne; a specimen of the variety in the Fishery Board's collection at Bay of Nigg measures slightly over one foot in length. Dr. Day remarks that the sea scorpion is said to attain to six feet in length in the Greenland seas, while the largest recorded example in Great Britain is fifteen inches.

Cottus bubalis, Euphrasén. The Father Lasher.

Moderately common in Loch Fyne (B. & S., 1886). "A very young specimen was obtained at the Mull of Cantyre in 60 fathoms in February, and another immature one in the Sound of Sanda in 20 fathoms in March, 1885" (Günther). Little Harbour, Upper Loch Fyne, December 1896. Off Inveraray, 1897. Young specimens are moderately frequent amongst seaweed in the shallow inshore bays of Loch Fyne.

Cottus lilljeborgii, Collett. The Norway Bullhead.

"Off Ardrossan, 15 to 30 fathoms; Sound of Sanda, 20 fathoms" (Günther). This is one of the species added to the British fauna by Dr. (now Sir) John Murray. It seems to be a small species. The specimen caught off Ardrossan measured $2\frac{1}{2}$ inches in length, while that from the Sound of Sanda was only $1\frac{3}{4}$ inches long.

Trigla lineata, Gmelin. The Streaked Gurnard.

East Loch Tarbert, Loch Fyne, not common (B. & S.). One was obtained in the trawl of the s.s. "Garland" at trawling Station VI.* (near the mouth of the Clyde) on November 25th, 1895. Two were captured at trawling Station XI. on April 21st, 1897, and another at Station VIII. in September of the same year. Mr. Pearcey records that five were caught last year (1899) at Stations I., VI., VII., and IX. Dr. Day refers to one specimen of *T. lineata* having been procured near Ayr, and a second in October 1844 at Glasgow.† It appears to be a rare species in the Clyde.

Trigla cuculus, Linné. The Red Gurnard.

Red Gurnards are occasionally captured by the "Garland" in the seaward part of the Clyde estuary, but do not seem to be very common. They appear to have been more frequently recorded from the Clyde last year (where the "Garland" was chiefly employed) than for some years previously. In looking over the returns of the "Garland" for 1899, it is interesting to observe that while these fishes were captured in every haul made at Station VI., at Station VIII. they occurred in three of the hauls, and in only two of the hauls made at each of the Stations I., VII., IX., and X. At Stations III. and XII. they were only once captured, and none are recorded from any of the hauls made at Stations II., IV., V., and XI.

Ninety hauls were made by the "Garland" last year at Stations I. to XII., and Red Gurnards were obtained in twenty-one of them; the number of specimens recorded from these twenty-one hauls is 73, and the number obtained in each haul may be summarised as follows:—

* The situation of the Stations is described on p. 20 of this Report.

† *British Fishes*, Vol. I., p. 58.

7	hauls	contained	1	Red	Gurnard	each =	7.
3	,,	,,	2	Red	Gurnards	each =	6.
3	,,	,,	3		,,	,, =	9.
3	,,	,,	4		,,	,, =	12.
1	,,	,,	5		,,	,, =	5.
1	,,	,,	7		,,	,, =	7.
2	,,	,,	8		,,	,, =	16.
1	,,	,,	11		,,	,, =	11.
21			73				

Fifteen specimens of Red Gurnards were obtained in one haul at Station VIII. in December 1898, but such a large number in one haul is exceptional. They are also recorded by Landsborough in his *Natural History of Arran*, p. 492.

Trigla lucerna, Linné. The Sapphirine Gurnard.

This, which is the *Trigla hirundo* of Day's *British Fishes*, appears also to be moderately rare in the Clyde. Thompson remarks that he has seen this species in autumn captured in salmon nets at Ballantrae, in Ayrshire, and on different parts of the coast in the country (Day).* I do not find it recorded amongst the captures of Clyde fishes made by the Fishery steamer "Garland."

Trigla gurnardus, Linné. The Grey Gurnard.

Common, and generally distributed throughout the seaward part of the Clyde and in Loch Fyne, especially during the summer months. This seems to be a common species throughout the Scottish seas. Large quantities of gurnards are sometimes landed at the fish market at Aberdeen, and they nearly all belong to this species.

Triglops murrayi, Günther. Murray's *Triglops*.

"Several specimens from $2\frac{1}{2}$ to 4 inches long were obtained at the Mull of Cantyre at a depth of 64 fathoms in the months of February and March, and 4 miles south-east of the Island of Sanda in 35 fathoms in the middle of March 1887" (Günther). One specimen $2\frac{1}{2}$ inches long was captured in the shrimp-trawl of the "Garland," in the vicinity of Sanda, November 1896. *Triglops murrayi* is described as closely allied to *Trigla pengellii*; it is one of the species added to the British fauna by Dr. (now Sir) John Murray.

Fam. Cataphracti, Müller.

Agonus cataphractus, Linné. The Pogge.

Ardrishaig (Dr. Scouler). Occasionally in other parts of Loch Fyne and the Clyde estuary. "Five specimens from the Mull of Cantyre, 49 to 50 fathoms, February. Two specimens from Kilbrennan Sound, 10 to 20 fathoms, March 1888" (Günther). It has also been got by the "Garland" at Stations I. and VI.

Fam. Pediculati, Cuvier.

Lophius piscatorius, Linné. The Angler.

The Angler is frequently taken in the trawl-net of the Fishery steamer "Garland," and especially at those stations where the water is

* *British Fishes*, Vol. I., p. 62.

moderately deep. One or more are got in most hauls of the trawl at all the Stations, except in Loch Fyne, where it is much less common. No specimens have been caught at Stations XV. or XVII.; one was taken at Station XVI. in over 60 fathoms. The largest obtained was 49 inches (Station I., 30th May 1899). *Lophius* is sometimes obtained larger than any of the Clyde specimens; in December 1841 Thompson examined one that was four and a half feet in length.*

Fam. TRACHINIDÆ, Risso.

Trachinus vipera, Cuvier. The Lesser Weaver.

Recorded from Arran by Dr. Landsborough in his *Natural History of Arran*, p. 318. He states that the lesser weaver is known to the people at Lamlash as the "Stangster" or "Stang-fish."

Fam. SCOMBRIDÆ, Cuvier.

Scomber scombrus, Linné. The Mackerel.

Shoals of mackerel are occasionally observed both in the Clyde estuary and in Loch Fyne, and considerably over a thousand cwts. are usually landed by fishermen each year. Dr. Day, though he gives a very full description of the habits, habitats, etc., of the mackerel, makes no allusion to its occurrence in the Clyde or Loch Fyne, neither is any notice taken of its occurrence in these places in the *Vertebrate Fauna of Argyle and the Inner Hebrides.*

Orcynus thynnus, Linné. The Tunny.

Pennant records a specimen weighing 460 lbs. taken at Inveraray in 1769. An example, 9 feet long, was captured in the Gareloch, nearly opposite Greenock, in July 1831.† This last specimen is said to have been in pursuit of herrings.

Thynnus pelamys, Linné. The Bonito.

One was captured in the Clyde in July 1832,‡ and purchased for the Andersonian Institute of Glasgow.§ Jenyns is doubtful if the fish recorded by Dr. Scouler is the true *Thynnus pelamys*, but suggests that it is more likely to be the next one.

Pelamys sarda, Bloch. The Belted Bonito.

One was captured in the Clyde in 1859, and is now in the Hunterian Museum, Glasgow.

Fam. CORYPHÆNIDÆ (part), Swainson.

Brama raii, Bloch. Ray's Bream.

One specimen in the Hunterian Museum was taken near Ayr (H.B., p. 188).

Lampris luna, Gmelin. The Opah or King Fish.

One was taken in the Clyde in 1833 (Scouler). A specimen of the king-fish in the Hunterian Museum, Glasgow, was captured in the Clyde in 1864.

* Day, *British Fishes* Vol. I., p. 76.
† Day, *British Fishes*, Vol. I., p. 97.
‡ Scouler, *Mag. Nat. History*, Vol. VI., p. 529 (1833).
§ Day, *British Fishes*, Vol. I., p. 101.

Fam. Cyttidæ, Kaup.

Zeus faber, Linné. The John Dory.

The John Dory has been taken off Rothesay (H.B., p. 186); in Loch Fyne (B. & S.); in Kilbrennan Sound in the shrimp-trawl of the Fishery steamer "Garland," and in other parts of the Clyde estuary (Stations I., II., III., VI., and VII.), but most of the Clyde specimens I have seen are small and immature. Those taken by the "Garland" usually range from 10 to 14 inches; the largest was 19 inches and the smallest three inches.

Fam. Gobiidæ, Cuvier.

Gobius flavescens, Fabricius. The Two-Spotted Goby.

Loch Fyne (Dr. Scouler); common amongst *Zostera* in East Loch Tarbert (B. & S.); Upper Loch Fyne (M.); also in various parts of the Clyde estuary (G.). Though *Gobius flavescens* is widely distributed throughout the Clyde area it does not appear to be very common. This is the *Gobius ruthensparri* of Day's *British Fishes.*

Gobius niger, Linné. The Black Goby.

Taken in the Clyde area (H.B., p. 193). Moderately common, especially off shore; but most of the specimens captured by the "Garland" are of comparatively small size, few of them reaching a length of four inches.

Gobius minutus, Gmelin. The Spotted or Speckled Goby.

Common, and generally distributed throughout the estuary, including Loch Fyne and the other sea-lochs within the Clyde area. Günther records *Gobius minutus* from Loch Goil in 45 fathoms, and in the vicinity of Cloch Lighthouse in 43 fathoms. It has also been taken by the "Garland" at the head of Upper Loch Fyne in from 17 to 35 fathoms.

Gobius jeffreysii, Günther. Jeffrey's Goby.

"Three specimens were obtained in April, viz., in Lamlash Bay (6 to 18 fathoms), off Whiting Bay (20 fathoms), and off Cumbrae Light (56 fathoms). Five specimens in August off the Cloch Lighthouse in 43 fathoms. Two adult specimens, male and female, obtained in Kilbrennan Sound at an uncertain depth (10 to 45 fathoms) on March 22nd, 1888" (Günther). This species has not yet been obtained by the Fishery steamer "Garland."

Several of the species of *Gobius* are somewhat difficult to make out, and it is just possible that other species in addition to those named may also occur in the Clyde.

Fam. Callionymidæ, Richardson.

Callionymus lyra, Linné. The Dragonet or Gemmeous Dragonet.

The dragonet is not uncommon in the Clyde and Loch Fyne; it is frequently mentioned amongst the captures of fishes made by the Fishery steamer "Garland," and especially amongst the fishes taken with the shrimp-trawl. As many as 47 specimens were recorded from one haul made on November 11th, 1896, and Mr. Pearcey records 125 specimens captured in a single haul on September 5th 1897, between Cantyre and Ailsa Craig.

Callionymus maculatus (Bonaparte). The Spotted Dragonet.

Kilbrennan Sound, rather abundant at 26 fathoms; Sound of Sanda, 24 to 28 fathoms (H.B., p. 194). Occasionally captured in the shrimp-trawl of the Fishery steamer "Garland."

Fam. Discoboli, Cuvier.

Cyclopterus lumpus, Linné. The Lumpsucker or Cock-Paidle.

The lumpsucker is occasionally captured in the Clyde by the "Garland." Young specimens are sometimes observed in the tow-net gatherings collected in Loch Fyne as well as in other parts of the Clyde estuary. Thompson mentions its existence in the vicinity of Ayrshire.*

Cyclogaster liparis, Fleming. The Sea Snail or Sucker.

The sucker is not uncommon in Loch Fyne, and also in the Clyde, but usually inshore where the water is shallow and the bottom weedy. It is, however, recorded from water that is also of considerable depth. Dr. Günther in his report to the Royal Society of Edinburgh† records many specimens from 49 and 64 fathoms in the vicinity of the Mull of Cantyre, and three specimens from 30 to 40 fathoms between Cumbrae and Wemyss Point. It has been got by the "Garland" in 66 fathoms, 8 miles W. by N. of Corsewall Point, and in the same depth S.E. of the Mull of Cantyre.

Cyclogaster montagui, Donovan. Montagu's Sucker.

Not so common as the last, but the habitat is somewhat similar.

Fam. Gobiesocidæ, Bleeker.

Lepadogaster gouanii (Lacep.). The Cornish Sucker.

This species has been taken at Millport (H.B., p. 198). I have not yet seen a Clyde specimen of *Lepadogaster gouanii*; but probably it may not be very rare if sought for in the right places.

Lepadogaster bimaculatus (Cuvier). The Doubly-spotted Sucker.

Recorded by Dr. Landsborough from Lamlash Bay, Arran. He describes it as "far from being rare."‡ Taken in the Clyde area (H.B.).

Anarrhichas lupus, Linné. The Wolf Fish, Cat fish.

Not uncommon amongst the captures of fishes made by the s.s. "Garland," both in the Clyde and Loch Fyne.

Fam. Blenniidæ, Swainson.

Blennius pholis, Linné. The Shanny.

In Clyde area (H.B., p. 185). Mr. Alex. Gray, of the Marine Station, Millport, Cumbrae, in a note dated December 11th, 1899, says:—"Last spring I caught a specimen of *Blennius pholis* here, and kept it alive for about four months. Unfortunately it managed somehow to jump out of the tank, and in the morning I found it on the floor, dead. It is now in our collection, preserved in formaline."

* Day, *British Fishes*, Vol. I., p. 182.
† Proc. Vol. XV., p. 41.
‡ *Natural History of Arran* (1875), p. 328.

Chirolophis galerita, Linné. Yarrell's Blenny.

One specimen was taken amongst boulders at low water in East Loch Tarbert in 1885 (B. & S.). Ballantrae Bank, one specimen in January 1899 (G.).

Pholis gunnellus, Linné. The Gunnel or Butter-fish.

The butter-fish is common and generally distributed, and especially inshore amongst weed and stones, where it may frequently be found when the tide recedes.

Euchelyopus (*Zoarces*) *viviparus*, Linné. The Viviparous Blenny.

A specimen of this species, captured in the vicinity of Row, near Helensburgh, is in the collection of the late Dr. Robertson of Millport at the Marine Station there. I am indebted to Mr. Gray, the Curator, for this record.

In the *Vertebrate Fauna of Argyle and the Inner Hebrides*, the viviparous blenny is recorded from Loch Creran, the Sound of Jura, and from Glenshiel, "but it seems to be rare on the West Coast." There is no Clyde record for the species in this work.

Lumpenus lampetræformis (Walbaum). The Sharp-tailed Lumpenus.

"Three adult specimens were found between Cumbrae and Skelmorlie Lighthouse in 20 fathoms in April 1887, and at Cumbrae Lighthonse in 60 fathoms in February 1888" (Günther). Occasionally captured off shore in the shrimp trawl-net of the Fishery steamer "Garland." As many as a dozen specimens of this rare species have been taken at one time by the Fishery steamer in the lower part of the Clyde estuary, whilst in 1896 four specimens were captured near the head of Upper Loch Fyne.

It requires a net with moderately close meshes to capture this species—an ordinary trawl-net is usually ineffective.

In a work on British Natural History published in 1898, the author, F. G. Aflalo, has the following note within square brackets at p. 371 :—"The sharp-tailed lumpenus was once trawled (1884) off the Carr Lightship," and he adds that he gives this record "on the authority of M'Intosh and Masterman"; evidently he was unaware of Dr. Günther's records for the Clyde, and the Fishery Board's for the Firth of Forth.

Fam. Cepolidæ, Bleeker.

Cepola rubescens, Linné. The Red Band Fish.

One $15\frac{1}{2}$ inches long was taken on a whiting line 7 miles south of Ayr (Harvey). Another $19\frac{1}{2}$ inches long was found on the beach at Ballantrae after a storm (Thompson). "Two have been taken on the Ayrshire coast just inside the Clyde area" (H.B., p. 195). Perhaps this last record refers to the same specimens mentioned by Harvey and Thompson.

Fam. Atherinidæ, Günther.

Atherina presbyter, Cuvier. The Sand Smelt or Atherine.

Frequent amongst zostera in East Loch Tarbert in the spring of 1885, but not met with later (B. & S.). Mr. Gray, of the Millport Marine Station, states :—"On two occasions I saw shoals of these little fishes in Campbeltown Loch—once at the Kilbrennan shore, where they were pursued by a number of guillemots, which chased them so keenly that

they jumped clean up on the gravelly beach, and I collected quite a number of living specimens. Many of the fishes were fully two feet from the water's edge."

Fam. MUGILIDÆ.

Mugil capito, Cuvier. The Grey Mullet.

The "ear-stones" (*otolites*) of a grey mullet (*Mugil capito*, Cuv.), captured in the Clyde off Fairlie, are in the collection of the late Dr. Robertson of Millport, at the Marine Station there. I am indebted to Mr. Gray, the Curator, for this record.

In the *Vertebrate Fauna of Argyle and the Inner Hebrides*, *Mugil capito* is recorded from several localities on the West Coast of Scotland, but there is no record of it from the Clyde.

Fam. GASTEROSTEIDÆ.

Gasterosteus aculeatus, Linné. The Three-spined Stickleback.

Captured occasionally with the push-net at various parts of the shores of Loch Fyne ; we have it also from other parts of the Clyde estuary.

Gasterosteus spinachia, Linné. The Fifteen-spined Stickleback.

The fifteen-spined stickleback is more or less common amongst sea-weed in shallow water ; it is generally distributed along the shore line, both of the Clyde estuary and the lochs branching from it.

Fam. LABRIDÆ, Cuvier.

Labrus bergylta, Ascanius. The Ballan Wrasse.

The Ayrshire and Wigtown coasts (Thompson). In the Clyde area (Dr. J. Young, *vide* H.B., p. 199). Frequent in Loch Fyne in the autumn (B. & S.).

Labrus mixtus, Linné. The Striped Wrasse.

Taken occasionally at the mouth of East Loch Tarbert, Loch Fyne (B. & S.). It is also recorded in Harvey-Brown's *Vertebrate Fauna of Argyle and the Inner Hebrides*, and on the authority of Dr. J. Young as occurring in the Clyde area.

A male and a female of this species were captured in Ayr Bay by a fisherman on January 30th this year (1900); the specimens were secured by Mr. Duthie, Fishery Officer, Girvan, who happened to be in Ayr at the time, and were forwarded by him to the Laboratory at Bay of Nigg.

Crenilabrus melops, Linné. The Goldsinny or Corkwing.

A small specimen of the goldsinny was captured by the "Garland" near Cairndow, at the head of the Loch Fyne, in August 1899. One specimen from Lamlash Bay in 6 to 18 fathoms, April (Günther).

Ctenolabrus rupestris, Linné. Jago's Goldsinny.

Common, especially near Skate Island, Loch Fyne (B. & S.). Occasionally obtained in the trawl-net of the Fishery steamer "Garland." One specimen was obtained in Lamlash Bay in 6 to 18 fathoms, in April, and another between Cumbrae and Skelmorlie Buoy in 20 fathoms, in the same month, 1887 (Günther).

Centrolabrus exoletus, Linné. Small-mouthed Wrasse, Rock Cook.

Taken occasionally in Loch Fyne (B. & S.).

Coris julis (Linné). The Rainbow Wrasse.

Recorded for the Clyde area on the authority of Dr. J. Young (H.B., p. 200).

Order ANACANTHINI.

Fam. GADIDÆ, Cuvier.

Gadus callarius, Linné. The Cod.

Common and generally distributed. The natural habitat of the cod is in moderately deep water; this is shown by the fact that if they are exposed for a lengthened period to daylight their eyes become more or less diseased. When at Rothesay Aquarium in 1886–87 I observed that the eyes of almost all the specimens of cod kept there were diseased, and one specimen was entirely blind and had to be fed separately. This disease, which at first took the form of an opaque white spot, but which gradually extended all over the eye, was ascribed to the fish being kept exposed to the daylight. The cod were the only fishes in the Aquarium that were affected in this way.

Gadus æglefinus, Linné. The Haddock.

More or less frequent, and generally distributed throughout the Clyde area, but much less abundant than on the East Coast. Upper Loch Fyne in the centre in 65 to 70 fathoms (M.); between Pennymore and Inveraray (G.).

Gadus luscus, Linné. The Bib, or Whiting Pout.

Occasionally in Tarbert harbour (B. & S.); Tarbert Bank, Lower Loch Fyne; and between Dunderawe and Cairndow, Upper Loch Fyne (G.). Generally distributed throughout the Clyde estuary, but seldom more than 8 to 10 inches in length. Two, 13 inches in length, were obtained near Sanda Island in May 1897. A specimen in the Fishery Board's collection in the Laboratory at Bay of Nigg measures fully 15 inches in length.

Gadus minutus, Linné. The Poor or Power Cod.

Dr. Günther in his paper on Clyde Fishes states that "the specimens obtained on March 10th and 17th were ready to spawn, and had fed on *Nyctiphanes*, sand eels, and *Aphrodite*." This *Gadus* is usually more or less in evidence amongst the contents of the shrimp-trawl of the Fishery steamer "Garland."

Gadus esmarkii (Nilsson). The Norway Pout.

According to Dr. Günther, the distribution of this species in the Clyde extends from Kilbrennan Sound to Lower Loch Fyne, where young specimens were found in tolerable abundance at 80 fathoms. He also remarks that "the species does not appear to be unfrequent in Kilbrennan Sound." He states further that "the characteristics by which *Gadus esmarkii* can be distinguished from its British congeners are:—The lower jaw, which projects beyond the upper; the dentition, the teeth of the outer series in the upper jaw being a little larger than the inner ones; the

length of the snout, which is almost equal to the length of the diameter of the eye, which is a little less than one-third the length of the head; the slender barbel, which is about half as long as the eye; and, finally the fin formula—it being D 15–16, 23–25, 22–25; A 27–29, 23–25" (H.B., p. 203). *Gadus esmarkii* is, in some respects, not unlike *Gadus minutus*, and may have occasionally been mistaken for that species. It is occasionally taken in the shrimp trawl-net of the "Garland."

Gadus merlangus, Linné. The Whiting.

This is one of the more common and generally distributed of the *Gadi*; but though extending into Upper Loch Fyne it is described as "not abundant" there. The whiting appears to be more frequent in the seaward portion of the Clyde estuary than it is in the more inland parts.

Gadus poutassou, Risso. Couch's Whiting.

This is readily distinguished from other British *Gadi* by the position of the dorsal fins, and especially by the distance between the second and third dorsals being greater than the distance between the same fins in the whiting, which it somewhat resembles. Three specimens of *Gadus poutassou* were captured in the shrimp-trawl of the "Garland" at the mouth of the Clyde estuary, in 54 fathoms, on September 22nd 1897. These specimens are now amongst the collection of fishes in the Fishery Board's Laboratory at Bay of Nigg.

Gadus virens, Linné. The Coal-fish or Saithe.

Moderately common and generally distributed, but mostly of small size. Full grown coal-fish do not appear to be very plentiful in the Clyde, but the young "podlies" sometimes occur in great numbers in inshore localities, as at East Loch Tarbert harbour and wharf.

Gadus pollachius, Linné. The Pollack or Lythe.

More or less frequent, but usually of small size; large specimens are occasionally brought to East Tarbert, Loch Fyne (B. & S.). The "Garland" also has records of lythe from Loch Fyne as well as off Sanda Island. The specimens from Sanda measured from 23 to 35 inches in length. *Gadus pollachius* has no barbel on the lower jaw.

Merluccius vulgaris, Cuvier. The Hake.

The hake is frequently captured in the Clyde by the "Garland" at all the Stations, as many as 108 having been caught in a single haul of the net; most of the specimens are more or less immature, but sometimes range from 30 to 40 inches.

Phycis blennioides (Brun.). The Greater Fork-beard.

The late Dr. Robertson of Millport, Cumbrae, recorded this species as having been taken near Cumbrae in April 1890.* Mr. Alex. Gray, of the Millport Marine Station, informs me that "the palate and forked fins of a specimen of *Phycis* are in the Robertson collections," and are probably portions of the fish referred to by Dr. Robertson, as they agree with the description he gave of the specimen which he recorded. Several specimens of the greater fork-beard have occurred on the coasts of the Solway Firth†, but it seems to be rare in the Clyde.

**Proc. Nat. Hist. Soc. Glasgow*, Vol. III. (N.S.), p. 276 (1892). This specimen measured 24 inches in length.

†Day, *British Fishes*, Vol. I., p. 304.

Molua molva, Linné. The Ling.

The ling, though not uncommon in the Clyde, is not very often captured by the "Garland," and rarely more than one or two specimens are obtained in any single haul made by the beam-trawl.

Onos mustela, Linné. The Five-bearded Rockling.

Taken between tide marks in East Loch Tarbert; not common (B. & S.).

Onos cimbrius, Linné. The Four-bearded Rockling.

"Very common, and generally distributed in the Clyde area at depths varying from 6 to 65 fathoms in April, to 70 and 90 fathoms in July and August, to 100 fathoms in November at Upper Loch Fyne and Kilbrennan Sound, at 37 to 46 fathoms in December," &c. (Günther). *Motella cimbria* is frequently captured in the shrimp-trawl of the Fishery steamer "Garland," but rarely in quantities, usually only one or a very few specimens being taken at one time.

Onos tricirratus, Bloch. The Three-bearded Rockling.

The three-bearded rockling has been taken in Rothesay Bay and other parts of the Clyde area, but appears to be rare. Part III. of the *Sixteenth Annual Report of the Fishery Board for Scotland* contains records of the capture of a few specimens in Upper Loch Fyne.

Onos maculatus, Risso. The Spotted Rockling.

"Loch Fyne, 40 fathoms; Mull of Cantyre, 65 fathoms" (Günther). This species somewhat resembles the last, but the front teeth are large. If *Onos tricirratus* and *maculatus* be really distinct species, the Clyde specimens should perhaps be all included under the latter name.

Raniceps raninus, Collet. The Lesser Fork-Beard, Tadpole Hake.

A specimen of the lesser fork-beard was recorded from Loch Fyne by the late Dr. Scoular.*

Fam. Ophidiidæ, Müller.

Ammodytes lanceolatus, Le Sauvage. Greater Sand Launce or Sand Eel.

Taken occasionally in the neighbourhood of East Loch Tarbert (B. & S.). "Taken in the vicinity of Sanda Island, Sound of Sanda Cantyre. The young numerous about the end of March" (Günther).

Fam. Pleuronectidæ, Risso.

Hippoglossus vulgaris (Fleming). The Halibut.

The halibut is occasionally taken in Loch Fyne (B. & S.), but it is usually of small size.

Mr. Duthie, Fishery Officer at Girvan, states *in lit.*:—"Halibut are frequently got here in spring, though they cannot be called plentiful. On the 25th of March this year (1899) one boat landed four cwts., caught between Ailsa Craig and the Mull of Cantyre; the fish were of all sizes up to 112 lbs. or more—just what would have been a fair sample of Shetland-caught fish. I believe they are more plentiful in the neighbourhood of the 'Mull' than here, but an occasional fish is got all round this part of the Firth in the spring months when great-lines are

**Proc. Nat. Hist. Soc. Glasgow*, Vol. I., p. 8 (1868).

being used. Halibut are occasionally recorded at Ballantrae caught by cod or turbot nets. I have no doubt a stray specimen is also got between Arran and Ayr, although I do not at present remember of more than one cwt. being landed at Ayr this year."

Drepanopsetta plattessoides, Fabr. The Long Rough Dab.

"Many adults and young (2 inches in length) were obtained in 26 to 46 fathoms in Kilbrennan Sound in December. Many adults and young were also taken between Cumbrae and Wemyss Point in 30 to 40 fathoms in February 1888" (Günther). The long rough dab is very common and generally distributed throughout the Clyde area, especially off shore and in moderately deep water.

Bothus maximus (Linné). The Turbot.

"One captured in the Clyde area, August 28th, 1888; formerly numerous there" (Günther). Turbots have been taken in the trawl-net of the Fishery steamer "Garland" in the vicinity of Ailsa Craig, in the vicinity of Sanda Island, and in Kilbrennan Sound. Occasionally taken in Loch Fyne (B. & S.). There is a regular turbot fishery carried on off Girvan, a special net called the "turbot net" being used for the capture of the fish.

Bothus rhombus (Linné). The Brill.

The brill is rather more frequently recorded amongst the lists of fishes captured by the Fishery steamer "Garland" than the turbot, but mention is not often made either of the one or the other. The largest specimen of the brill referred to by Day is one recorded by Thompson, which measured 24 inches in length. The "Garland" has, however, obtained even larger specimens than that; one 25 inches was captured after nightfall at Station VII. on May 21st, 1897. A few measuring 21 and 23 inches have also been taken at different times.

Zeugopterus unimaculatus, Risso. One-Spotted Topknot.

"One specimen in 10 fathoms off Ardrossan, Clyde area, in April 1888" (Günther). Several specimens were captured in a shallow sandy bay at Barmore, Loch Fyne, in 1885 (B. & S.). Two of these specimens are still in the collection of fishes at the Fishery Board Laboratory, Bay of Nigg, Aberdeen.

Zeugopterus punctatus (Blainville). Müller's Topknot.

"Clyde area, 60 fathoms" (Günther). Upper Loch Fyne in 10 to 25 fathoms (M.). *Zeugopterus punctatus* has been taken in the trawl-net of the "Garland" in the vicinity of Ailsa Craig and in Kilbrennan Sound.

Rhombus norvegicus, Günther. The Norway Topknot.

Dr. Günther records the following specimens from the Clyde:—One dredged in Lamlash Bay at a depth of 6 to 18 fathoms, measuring $3\frac{1}{2}$ inches in length, and in excellent condition; one smaller than the last, caught off the Cloch Lighthouse in 43 fathoms; and one $3\frac{1}{2}$ inches long, caught in Kilbrennan Sound in 45 fathoms. (*See* also Dr. Günther's description of the larger of these specimens.*) The Norway topknot is occasionally taken in the shrimp-trawl of the "Garland," but it appears to be a rare species in the Clyde.

**Proc. Roy. Soc. Edin.*, Vol. XV., p. 47 (1888).

Lepidorhombus megastoma, Donovan. The Sail Fluke or Whiff.

The sail-fluke is recorded for the Clyde area by Dr. Günther (1886). It is a species that does not appear to be very rare in the Clyde area, especially in the seaward portion of it, and is more or less frequently mentioned amongst the captures of fishes made by the "Garland"; it is especially frequent at Stations VIII., IX., and X.

Platophrys laterna, Walbaum. The Scald Fish.

Recorded for the Clyde area by Dr. Günther (1888). Taken in the trawl-net of the "Garland" between Sanda Island and Bennan Head. This species appears to be a comparatively rare one in the Clyde estuary; a few specimens were taken last year (1899) at Stations II., V., VI., VII., VIII., and X.

Pleuronectes platessa, Linné. The Plaice.

This is a moderately common and generally distributed species from the head of Loch Fyne to the seaward limits of the Clyde estuary.

Pleuronectes microcephalus, Donovan. The Lemon Dab; also called Lemon Sole and Smooth Dab.

Clyde area, feeding on annelids and *solens* (Günther). The lemon sole is more or less frequent and generally distributed throughout the estuary of the Clyde, especially off shore. Annelids appear to constitute the principal food of the lemon sole, at least in Scottish waters, as shown by the investigations that have been made concerning fish-food on board the Fishery steamer "Garland."

Pleuronectes cynoglossus, Linné. The Witch Sole, Craig Fluke, Pole Dab.

This appears to be the most common of the flat fishes in the Firth of Clyde, especially in the deep water. Dr. Günther records its occurrence at a depth of 80 to 100 fathoms in Loch Fyne. It is most abundant at Stations III., VII., VIII., IX., XI., XII., XV., and XVII.; nearly 400 have been got in a single haul in Loch Fyne. Its food, like that of the lemon sole, consists chiefly of annelids, and it is probably on this account that the species is usually more common on a muddy bottom.

Pleuronectes limanda, Linné. The Common Dab.

Pleuronectes limanda is also one of the more common of the Clyde fishes, and seems to be distributed all over the estuary to the head of Loch Fyne, and probably also throughout the other sea-lochs within the Clyde area (Günther). It is got at all the "Garland" Stations.

Pleuronectes flesus, Linné. The Flounder or Fluke.

Common in Tarbert Harbour, Lower Loch Fyne (B. & S.). Occasionally obtained in Upper Loch Fyne (G.). One was captured off Largymore, Upper Loch Fyne, on April 28th, 1896, and a few have been captured in other parts of the loch with the push-net; but it seems to be a rare fish in the more seaward portion of the Clyde.

Solea vulgaris, Quensel. The Sole or Black Sole.

The black sole is occasionally taken in the trawl-net of the "Garland" at all the Stations, except in Loch Fyne; there are seldom more than one or two specimens, but occasionally ten or twelve, in a haul. It is more difficult to capture black soles during daylight than after darkness sets in. The food of the black sole appears to consist largely of annelids.

Solea variegata, Donovan. The Variegated Sole or Thickback.

"Two immature specimens were obtained in the vicinity of the Mull of Cantyre in 65 fathoms on March 21st, 1888" (Günther, p. 220). Two specimens, one about $3\frac{1}{2}$ inches long, the other slightly less, were captured near the mouth of the Clyde estuary at Station VI., on June 15th, 1899. They were taken with the shrimp-trawl of the "Garland," and are now in the collection in the Laboratory at Bay of Nigg.

Solea lutea, Risso. The Solenette or Little Sole.

The solenette has been recorded amongst the fishes captured by the "Garland," but appears to be rare in the Clyde.

Order PHYSOSTOMI, Müller.

Fam. SALMONIDÆ, Müller.

Salmo trutta (Fleming). The Sea Trout.

The sea trout is regularly taken in small quantities just outside East Loch Tarbert (B. & S.). A fine specimen, which, I understand, had been captured in the Clyde, was kept in one of the tanks in Rothesay Aquarium when I was there in 1886-87.

Salmo salar, Linné. The Salmon.

There are regular fisheries for salmon at various parts of the Clyde estuary, including the several sea lochs. The salmon is taken occasionally in herring-nets between Tarbert and Barmore, and probably also in other parts of the Clyde.

Osmerus eperlanus, Linné. The Smelt.

"One was taken with mussel-bait at Brodick, Arran, October 1888. Not uncommon" (H.B., p. 218).

Argentina sphyræna, Linné. The Hebridean Smelt.

"Three specimens were obtained in 32 fathoms between Little Cumbrae and Brigaird Point on February 7th, and five obtained in 37 fathoms in Loch Striven on February 15th, 1888" (Günther). The Hebridean smelt is not very rare in the Clyde estuary, when sought for with suitable apparatus; it is frequently taken with the shrimp trawl-net of the Fishery steamer "Garland," as many as seven specimens having been captured in a single haul; usually, however, only one or a few are obtained at one time.

Fam. SCOMBRESOCIDÆ.

Rhamphostoma belone. The Garfish.

A specimen of the garfish, 28 inches in length, was taken off Dunoon on May 25th, 1877 (Dr. F. P. Fleming).* It is taken in the Clyde area occasionally in shoals (H.B., p. 212). A young specimen was captured in the surface tow-net of the "Garland" in Loch Fyne.

Scombresox saurus, Walbaum. The Saury Pike.

Taken in the Clyde area (H.B., p. 212). We have not yet had the good fortune to capture this species, either in the immature or adult stages.

*This record is referred to in Dr. Day's *British Fishes*, Vol. II., p. 150.

[(?) *Exocetus volitans*, Linné. The Flying-fish.

The Rev. David Landsborough, in his *Natural History of Arran*, p. 386, states that the flying-fish has been seen in Ayr Harbour. Two or three kinds of fishes are spoken of as "flying-fish," but probably it is the species named above that he refers to.]

Fam. CLUPEIDÆ, Cuvier.

Clupea harengus, Linné. The Herring.

Common in the Clyde and Loch Fyne, where a great herring fishing is carried on. The movements and habits of the Clyde and Loch Fyne herring have been for a long time subjects of much interest to naturalists, and even yet are not very clearly understood.

Clupea sprattus, Linné. The Sprat.

Sprats are not uncommon in the Clyde, but owing to their having been frequently mistaken for young herring, there is some uncertainty as to their numbers and distribution.

Clupea alosa, Linné. The Allis Shad.

Very large specimens were taken in Loch Fyne in 1888 (H.B., p. 221). Mr. Gray, of the Millport Marine Station, says *in lit.*:—"A fine specimen of this fish was taken in a seine-net off Isle of Ross in the winter of 1894, and was put in spirits by me and left in the old museum in Kirk Street, Campbeltown, and is probably still preserved in the new museum there."

Fam. MURÆNIDÆ, Müller.

Anguilla vulgaris, Cuvier. The Common Eel.

The Common Eel affords a small but regular fishery in Tarbert harbour, Loch Fyne (B. & S.). It was also taken in the shrimp trawl-net of the "Garland" off Inveraray in May 1896.

Conger vulgaris, Cuvier. The Conger.

Moderately large specimens of conger are at times captured in the "Garland's" beam trawl-net, one 50 inches in length was taken near the head of Loch Fyne on May 5th, 1896; another of the same length was secured in the vicinity of Ailsa Craig on April 28th, 1897. A specimen 45 inches long is recorded from Whiting Bay, and others of somewhat smaller size from various parts of the Clyde area. I have taken a fairly big specimen between tide marks at Lunderston Bay after the tide had ebbed.

Order LOPHOBRANCHII, Cuvier.

Fam. SYNGNATHIDÆ.

Siphonostoma typhle (Linné). The Deep-nosed or Broad-nosed Pipe-fish.

A specimen of this species was captured amongst *zostera* in East Loch Tarbert (B. & S.). A specimen, which I believe to be the one now recorded here, is in the collection of fishes in the Fishery Board's Laboratory at Bay of Nigg.

Syngnathus acus (Linné). The Great Pipe-fish.

This species is not uncommon in the Clyde and Loch Fyne, especially inshore where the water is shallow.

Nerophis æquoreus (Linné). The Straight-Nosed Pipe-fish.

East Loch Tarbert, amongst *zostera* (B. & S.). A fine specimen is in the Robertson collection in the Marine Station at Millport, which was captured at Cumbrae.

Nerophis lumbriciformis (Linné). The Worm Pipe-fish.

Taken in East Loch Tarbert amongst *zostera* (B. & S.). I have taken this little fish amongst weed between tide marks in Lunderston Bay, near Inverkip, and it has also been taken by the "Garland" in Campbeltown Loch, Cantyre.

Hippocampus antiquorum, Leach. The Sea-horse.

Mr. Gray, of the Marine Station at Millport, writes to me concerning this species as follows :—"I picked up a specimen of *Hippocampus* on the Kinloch Park, Campbeltown, in the autumn of 1894, from a spot where herring seine-nets had been spread out to dry, and from the fresh condition of the fish I had no doubt whatever that it had been caught in the nets in the Sound of Kilbrennan, and been shaken out on the spot where I found it. Still I did not see it alive, so there is room for the element of doubt to creep in ; though this evidence, therefore, may not be quite conclusive, I have very little doubt in my own mind of the little fish having been caught in the Kilbrennan Sound. Moreover, I may mention, by way of confirming what has just been said, that during the past summer a gentleman visitor to the Marine Station told me that many years ago his own children caught two live *Hippocampus* in a pool on the Fairlie sands, and kept them alive for about a week in a vessel of sea-water. I took the gentleman to Mrs. Robertson of Fernbank, who happened at the time to be in the museum connected with the station, and to her he repeated the story also. Since then I feel more firmly convinced that the Campbeltown specimen was a genuinely local one."

Hippocampus has been recorded from Belfast Lough, which is not very far distant from the mouth of the Clyde ; and the same species is also recorded for the West Coast of Scotland in Harvey-Brown and Buckley's work on the *Vertebrate Fauna of Argyle and the Inner Hebrides.*

Order PLECTOGNATHI.

Fam. GYMNODONTES.

Orthagoriscus mola, Linné. The Short Sun-fish.

A specimen of the short sun-fish was captured off the Esplanade at Greenock on September 10th, 1881 (J. M. Campbell).* This specimen was said to weigh about a ton; it measured 7 feet 9 inches in length and 3 feet 9 inches in height. Mr. Campbell states that "the liver was absolutely crammed with a scolecid worm, *Tetrarhynchus reptans.*"

SUB-CLASS CHONDROPTERYGII.

Order GANOIDEI.

Fam. ACIPENSERIDÆ.

Acipenser sturio, Linné. The Sturgeon.

Fine specimens are often noticed in Loch Fyne during the herring fishery, but are seldom captured (B. & S.). Mr. Alexander Gray, of the

* *Proc. Nat. Hist. Soc., Glasgow*, Vol. V., pt. II., p. 177 (1883).

Marine Station, Millport, in a letter to me concerning some Clyde fishes, says that "a sturgeon was caught near Carradale in 10 to 12 fathoms of water; it was about 7 or 8 feet long, but in poor condition, and was sold in the Glasgow market by Mr. Lagan of Paisley for £1 15s. So far as I can recollect, this was in the late autumn of 1895. A few years previous to this I remember seeing another sturgeon, perhaps 5 or 6 feet long, that was caught in a salmon-net at Penimore Bay; I had no opportunity to examine this specimen, as it was shipped on the steamer ready for conveyance to the Glasgow market when I saw it."

Order ELASMOBRANCHII.

Fam. Carchariidæ.

Carcharias glaucus, Linné. The Blue Shark.

This shark has been taken in Loch Fyne (H.B., p. 177). Mr. A. B. Watt of Glasgow saw a specimen of *Carcharias* which had come ashore at Ayr Bay on the 11th or 12th September last year (1899).

Galeus canis, Rondel. The Tope or Toper.

Several specimens of this species were landed at Girvan in December last. They were at the time mistaken for another species, but were subsequently correctly identified as the tope. I am not aware of this species having been previously recorded for the Clyde; probably it is only an occasional visitor to the estuary, and may on former occasions have been passed over as one of the more common species. A fine specimen of toper was brought to Girvan by a local fisherman on December 28th. It was examined by Mr. Duthie, the Fishery Officer at that place, who was able to identify the species; the specimen measured 5 feet in length and 24 inches in circumference at the thickest part. Mr. Duthie was kind enough to secure the specimen and forward it to the Laboratory at Bay of Nigg, and I was thus enabled to verify Mr. Duthie's identification. The specimen was a female.

Fam. Lamnidæ.

[*Alopias vulpes* (Gmel.). The Thrasher or Fox Shark.

Captain Campbell, of the Fishery steamer "Garland," informs me that a year or two ago he was proceeding down Loch Fyne, and, having reached a point somewhere between Crarae and Castle Lachlan, but rather nearer the former place, he saw a thrasher making an attack on what was probably a cetacean of some kind; the thrasher was leaping clear out of the water in its usual way when engaged at this kind of work, and was coming down with a slap, the sound of which could be heard distinctly on board the vessel. Captain Campbell knows the thrasher quite well, and has frequently, when voyaging across the Atlantic, been an eye-witness of its tactics, so that there is little likelihood of his having been mistaken about the fish he saw in Loch Fyne.

My friend Mr. Gray of Millport tells me that in July 1895 a thrasher shark got into shallow water in Machrihanish Bay, and that some men there put off in a boat and, with ropes, managed to entangle it and haul it ashore close to the Pans Hotel. This specimen, which measured $15\frac{1}{2}$ feet in length, was seen by Mr. Gray soon after it was captured. Machrihanish, though not within the Clyde area, is only a few miles west from Campbeltown, and comparatively near the mouth of the Clyde, and tends to show that the *Alopias* may occasionally find its way into the Clyde estuary.]

Selache maxima (Gunner). The Basking Shark.

A young specimen measuring 8 feet in length was captured in Maidens Bay, near Turnberry, Ayrshire (*Scotsman* newspaper, September 26th, 1898). This record was confirmed by the Fishery Officer at Girvan. Dr. Landsborough, in his *Natural History of Arran*, refers to the occurrence of this fish in the Clyde, and says (pp. 95, 96):—"A century ago . . . it was a frequent visitor to the Clyde, and was taken at Ballantrae, in Ayrshire, as well as in Arran. It made its appearance in the first or second week in June, and generally remained only for three or four weeks, though occasionally seen considerably later. . . . Now it is seldom seen." Dr. Landsborough also describes the means by which the fishermen of Arran usually captured these sharks.

Fam. Scylliidæ.

Scyllium canicula (Linné). The Lesser Spotted Dog-fish, Rough Hound.

"A very young specimen, 8 inches long, was obtained in the Sound of Sanda, at a depth of 20 fathoms" (Günther). Two specimens, each about 25 inches in length, were captured by the "Garland" at Station I, Firth of Clyde, on May 25th, 1897, and three specimens, measuring respectively 25, 28, and 29 inches in length, were captured on the same day in the vicinity of Sanda Island. In a male specimen $12\frac{3}{4}$ inches long taken in 60 fathoms between the Mull of Cantyre and Corsewall Point on May 15th, the spots are distinctly larger than they are on the adult specimens, especially on the anterior portion of the body. This specimen is now in the collection of fishes in the Fishery Board's Laboratory, Bay of Nigg, Aberdeen.

[*Scyllium catulus*, Cuvier. The Larger Spotted Dog-fish, Nurse Hound.

The following notice appeared in the *North British Daily Mail* of December 11th, 1899 :—

"One of the Girvan great-line boats on Saturday, the 9th inst., had an unusual catch of dog or hound sharks. No fewer than seven were caught in the great-lines, set in Lendal Bay, south of Girvan. Some of them measured about 5 feet in length and 24 inches in girth. The species is known as *S. catulus*, or rock shark. The females were full of well-developed eggs. Where they abound they are most destructive to the fishermen by taking their bait and hooks off the lines. The fish were cut up for bait for the crab and lobster creels."]*

Pristiurus melanostomus (Bonaparte). The Black-Mouthed Dog-fish.

"Two adult males in Upper Loch Fyne, 37 fathoms" (Günther). One captured by a Cumbrae fisherman was exhibited at a meeting of the Natural History Society of Glasgow on January 26th, 1869. The black-mouthed dog-fish is occasionally brought into East Tarbert amongst the *Acanthii* in the winter fishing (B. & S.). Upper Loch Fyne, in 10 to 20 fathoms (M.). Captured by the "Garland" in the deep water between Arran and Turnberry Point.

Fam. Spinacidæ.

Acanthias vulgaris, Risso. Picked Dog-fish.

Sometimes of common occurrence in the Clyde and Loch Fyne,

*There appears to have been some mistake on the part of the writer of the above note concerning the name of the fish landed at Girvan on December 9th. I am able to state conclusively that the fish landed were Tope or Topers, *Galeus canis*, and not *Scyllium catulus* as stated (see page 289). I have been unable hitherto to obtain any satisfactory information as to the occurrence of the Larger Spotted Dog-fish within the Clyde estuary.

especially during the herring fishing. Few of those taken by the "Garland" are of large size; they seldom reach beyond 2 feet in length; whereas the picked dog-fish is stated by Day to attain a length of at least 4 feet off our shores; but such large specimens are probably of exceptional occurrence.

Fam. RHINIDÆ.

Rhina squatina (Linné). The Angel-fish or Monk-fish.

"In the Firth of Clyde it is by no means uncommon, and is frequently found there after gales; one was harpooned while asleep, but broke away."* This appears to be the only Clyde record for the angel-fish hitherto published. In the *Vertebrate Fauna of Argyle and the Inner Hebrides* it is stated that two specimens of the angel-fish in the Hunterian Museum, Glasgow, are from the West Coast, but no locality is given for them.

Mr. Wright, the chief Fishery Officer for the Barrow-in-Furness district of the Lancashire Sea Fisheries, states that he trawled in the Clyde for about eighteen winters previous to the closing of the estuary to that mode of fishing, and that during that time he occasionally captured angel-fish on the Ballantrae Bank. He knows the fish very well, and has brought specimens from Morecambe Bay to the Sea Fish Hatchery at Piel. The name he uses for the angel-fish is the "abbot."

Fam. RAIIDÆ.

Raia batis, Linné. The Skate, the Grey Skate or Blue Skate.

Moderately common and generally distributed, especially off-shore. Those captured by the "Garland" are seldom of large size, being usually mere pigmies when compared with the immense specimens sometimes landed at the fish market at Aberdeen. The largest taken by the "Garland" in the Clyde rarely exceed three feet in width.

Raia intermedia, Parnell. The Flapper Skate.

"A female with a disk 19 inches wide was obtained between Sanda Island and Ailsa Craig in 24 fathoms, March 6th, 1888" (Günther). The flapper skate has been taken by the "Garland" in the deep water to the east of Arran, and also in the vicinity of Ailsa Craig. (This is the *Raia macrorhynchus* of Day's *British Fishes.*)

Raia oxyrhynchus, Linné. Long or Sharp-nosed Skate.

Two specimens were captured by the "Garland" in the deep water to the east of Arran; both were comparatively small, one being only 21 inches and the other 29 inches across the pectoral fins.

Mr. Duthie, Fishery Officer, Girvan, informs me that on February 1st (1900) he saw a fine specimen of the long-nosed skate which had just been sent to Girvan from Maidens Village—a village not far from Girvan. The following measurements were taken by Mr. Duthie—Extreme length, 51 inches; extreme breadth, 34 inches; length from tip of snout to centre of closed mouth, 13 inches; length of tail, 18 inches; while from the tip of the tail to the vent was 21 inches.

Raia fullonica, Linné. Shagreen Ray, Fuller's Ray

"A female example, 24 inches across the disk, from Loch Fyne, off Skate Island, was obtained in 100 fathoms. An adult male, 19 inches across the disk, was caught in Kilbrennan Sound in 20 fathoms"

*A. Norman, *Zoologist*, Vol. XV. (1857), p. 5366.

(Günther). The shagreen ray is occasionally captured by the "Garland," but is apparently not very common in the Clyde.

Raia clavata, Linné. Thornback Ray or Thorny.

"One adult female was obtained in 26 fathoms in Kilbrennan Sound, and an immature male 17 inches wide in 24 fathoms between Sanda Island and Ailsa Craig. The contents of the stomach of the latter specimen consisted of small fish and crustaceans" (Günther). The Thorny is one of the more common of the fishes captured in the Clyde by the Fishery steamer "Garland," but the specimens are mostly of small size, and very few of them extend beyond 25 or 30 inches across the disk.

Raia maculata, Montagu. The Spotted Ray, or Homelyn Ray.

"An immature female was captured between Cumbrae and Wemyss Point in 30 to 40 fathoms. Another from the Sound of Sanda from 20 fathoms. One or two very young specimens from $2\frac{1}{2}$ to $4\frac{1}{2}$ inches across the disk were obtained off Ardrossan and off Whiting Bay" (Günther). The spotted ray is occasionally captured by the "Garland," but the specimens are usually of small size. One measuring 18 inches across the disk was taken in the vicinity of Ailsa Craig on April 27th, and one 10 inches across the disk at Station VI. on May 25th, 1897. A small specimen a little over 7 inches across the disk is in the collection of fishes in the Laboratory at Bay of Nigg.

Raia circularis, Couch. The Cuckoo Ray, Sandy Ray.

"An adult male, 14 inches across the disk, and a very young female, $3\frac{2}{3}$ inches broad, were obtained in the Sound of Sanda at a depth of 20 fathoms on March 10th; another adult male, also from the Sound of Sanda, was obtained at 49 fathoms on March 17th, 1888" (Günther). The cuckoo ray has been taken by the "Garland" in Whiting Bay, in the vicinity of Sanda Island, in the vicinity of Ailsa Craig, and in various parts of Upper Loch Fyne. It does not appear to be a very rare fish in the Clyde area.

SUB-CLASS CYCLOSTOMATA.

Fam. Myxinidæ.

Myxine glutinosa, Linné. The Hag-fish.

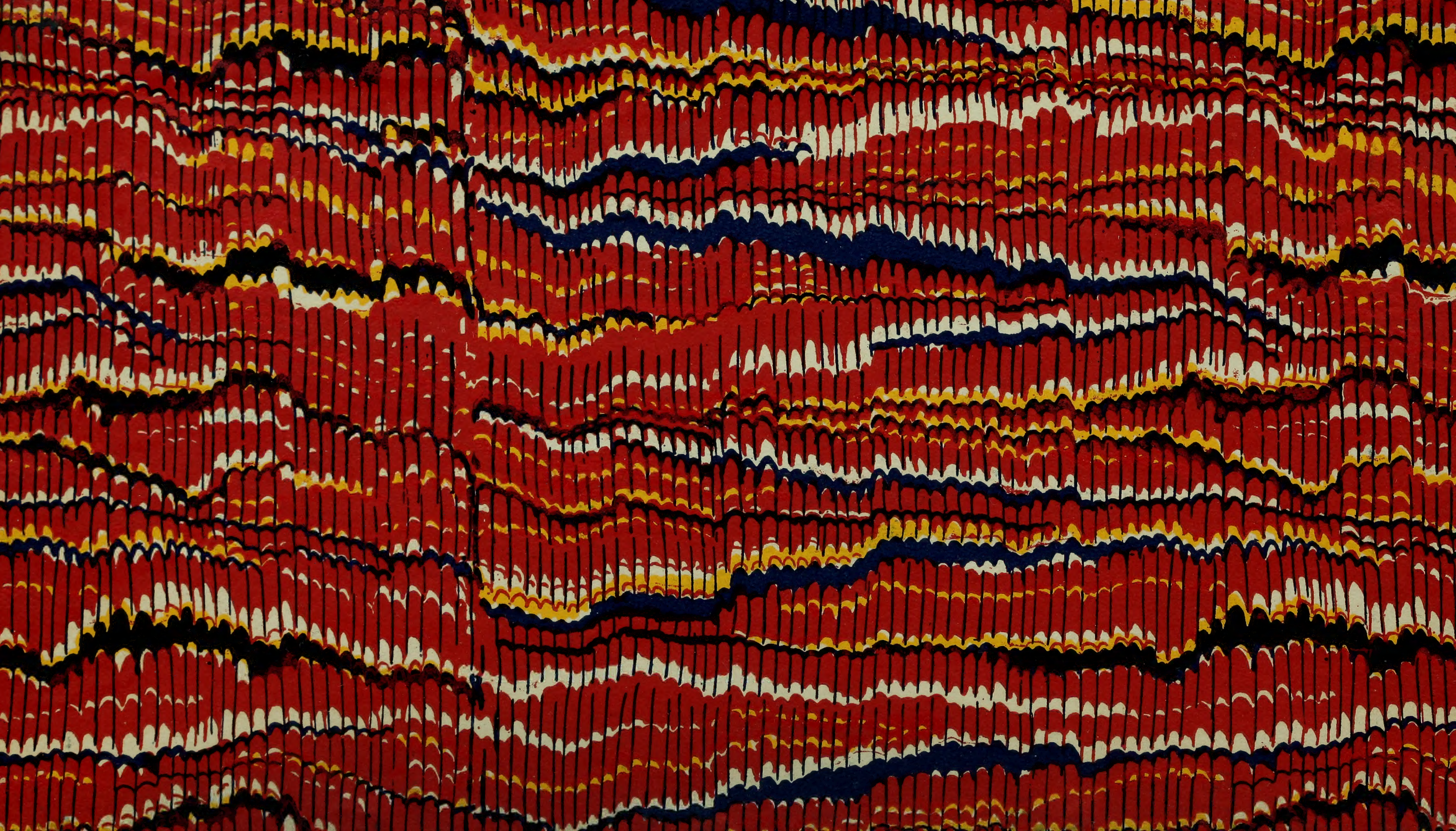
The hag-fish has been taken at Rothesay in the Clyde area. It is said to be numerous and most destructive to the line fishes off Girvan (H.B., p. 225). I do not remember having seen *Myxine* in the Clyde.

SUB-CLASS LEPTOCARDII

Fam. Cirrhostomi.

Branchiostoma lanceolata, Pallas. The Lancelet.

"Amphioxus" is "taken plentifully in suitable ground in the Clyde area" (H.B., p. 225). Mr. Gray, of the Millport Marine Station, states, in a letter to me, that "over a dozen specimens of this little fish were taken on a bank between Little Cumbrae and Hunterston, locally known as the *Dogger Bank*." Dr. James Bryce, in his *Geology of Arran and Clydesdale* (1865), p. 250, remarks that the *Amphioxus* has been dredged at the north end of Holy Island, and has been obtained in Lamlash Bay, as well as near Millport. Dr. Landsborough also speaks of having found it when dredging near Cumbrae.



SMITHSONIAN INSTITUTION LIBRARIES
3 9088 00049 1142